We have had two specimens of this variety in the British Museum since 1859; and more lately, Mr. Jamrach has sent me five or six specimens, of different sizes, to examine, which he had received from North Australia. Some of the specimens are larger and rather more ventricose than any of the typical form that I have seen. The two specimens of this variety in the Museum have the suture rather impressed; but I believe this is only an accidental circumstance.

3. *A. T. Broderipi.* The shell solid, and like No. 1; but the streaks are very narrow, linear, and more or less acutely sinuated, sometimes anastomosing and forming a network.

There are two specimens of this variety in the Museum—one from Mr. Broderip's collection.

4. *A. T. Damonii.* Shell with close angular intersecting lines, forming crowded triangular spots on the surface; the sutural callosity very dark.

This shell, which was sent to the British Museum by Mr. Damon, is marked much like *Oliva texturata*. It differs from *Amoria reticulata*, with which it has been confounded, in the shell being less ventricose.

5. *A. T. Cumingii.* Like the former; but the netted lines are much firmer, and there are two spiral series of small irregular spots.

A small specimen in the British Museum collection, the most beautiful variety of the series, received, in 1859, with *A. T. Jamrachii*, as *Voluta pertusa*.

6. *A. T. maculata.* Shell pale brown, with two spiral series of large squarish dark spots, and a series of large irregular spots near the suture. (*Voluta maculata*, Swainson, Zool. Illust. t. .)

7. *A. T. pallida.* Shell pale brown, nearly uniform in colour, but sometimes marked with more or less distinct brown spiral bands, or with transverse stripes or very obscure netted lines. (*Voluta pallida*, Gray.)

I am aware that some conchologists may be inclined to regard these varieties as species, though I have seen specimens which seem to unite all of them into one series: I have therefore chosen for them names by which they may be so designated.

On the Motory Phenomena of the Sponges.

By N. Lieberkühn.

Of the movements hitherto observed in Sponges, some are concerned with portions of the skin and efferent tubes, and others with isolated cells.

During the contraction of the efferent tubes, the wall of these organs becomes thickened by shortening, and its surface becomes mamillated, allowing us to recognize the limits of cells which were previously indistinct. The movements of the integument consist in an approximation or separation of the parenchyma of the body, and also in the opening and closing of the pores of ingestion. The isolated cells are capable of changing their form, so as to present, for example, alternately a spherical and a stellate appearance. Hitherto no one has observed any displacement of cells; but movements of this

nature are described by Lieberkühn in his recent memoir on the *Spongillæ*.

The parenchyma of the body of the *Spongillæ* presents a very variable arrangement, whilst the siliceous skeleton retains the same characteristic form in all specimens. Sometimes the parenchyma exhibits a cavernous structure, containing cavities more or less isolated from each other, and connected either with the orifices of ingestion or with tubes of ejection; sometimes these cavities are replaced by a system of canals extending through a great portion of the Sponge, and opening directly into the tube of ejection; in this case a great part of the integument is destitute of orifices of ingestion. In other cases the cutaneous pores are dispersed in great numbers over the whole surface of the Sponge, and usually lead into a large cavity belonging to the system of ingestion. The walls of the partitions bounding these cavities bear vibratile apparatus. In other *Spongillæ* there do not exist membranous partitions bounding the cavities; but the body is traversed in all directions by trabeculæ of different thicknesses, which are often supported upon the integument. Some of these are completely smooth in appearance, and show no appreciable outlines of cells; the strongest bear vibratile apparatus: others are constricted like a necklace, being formed of a simple series of cells in juxtaposition. Others, again, are composed of several rows of cells, of which the limits are visible only at the surface (so as to resemble an epithelial coat) or only at the centre of the trabecula.

All these different appearances may be presented successively by one and the same *Spongilla*. Homogeneous parenchymatous partitions have contracted, under the eyes of M. Lieberkühn, into trabeculæ with a cellular structure and of a necklace-like form. On the other hand, he has seen neighbouring trabeculæ spread out and become united in such a manner as to form a membranous wall. The cavities open into one another, and separate again. Fragments of *Spongillæ* artificially detached prove that the cells of the parenchyma can unite in a few hours to form a cutaneous envelope.

The pores of ingestion are not characteristic of the integument, as perfectly similar orifices are seen to originate in the membranous partitions of the interior of the body. The tubes of ejection are the seat of very peculiar movements. The author has seen the cells of the innermost layer gliding up the wall of the tube, and again descending.

M. Lieberkühn has positively demonstrated a fact which has only been suspected since the observations of Laurent—namely, the reproduction of Sponges by spontaneous division. In individuals kept in vessels filled with spring water he has seen the body contract, and emit here and there processes, which soon became detached and glided over the vacant portions of the siliceous skeleton, and even upon the bottom of the vessel. This division appears only to take place in individuals which are nearly perishing. But the fragments thus set free continue to live, and in the course of a few weeks they have produced in their interior siliceous spicules and vibratile cilia.

In these fragments of *Spongillæ*, and in perfect individuals in a dying state, M. Lieberkühn has witnessed phenomena which might

readily give rise to mistakes. Cells of the animal detach themselves from the mass, and remain scattered all round it. Some of these are finally dissolved, but others (or, at least, bodies which cannot be distinguished from them in appearance) begin to emit very delicate transparent filaments, resembling those of *Actinophrys*. Some of these bodies even become encysted in the manner of *Actinophrys* and *Amœba*. From these, four or five monociliated Monads are sometimes seen to issue: these are capable either of creeping in the manner of *Amœba*, or of swimming by the agency of their flagellum. These creatures are sometimes present in such great number, in the interior of dying *Spongillæ*, that one might be led to regard them as masses of sponge-cells. We should then have to recur to Dujardin's notion that the *Spongillæ* were merely masses of *Amœbæ* inhabiting a sort of siliceous polypary. M. Lieberkühn, however, shows that these bodies form no integral part of the *Spongilla*, and that they appear also in great quantities in the ova of fishes and other animals when in course of perishing. But he does not settle the question whether the Monads are the embryos of these kinds of *Amœbæ*, or whether we are to consider them as parasites of these parasites. It is interesting to compare these facts with the observations made by Jæger upon *Hydra*. It has been asserted that these animals are capable of breaking up into little unicellular Amœbiform creatures, which on their part can reproduce the *Hydræ*. Is not this an analogous case of parasitism misinterpreted?—*Müller's Archiv*, 1863, p. 717; *Bibl. Univ.* June 20, 1864, *Bull. Sci.* p. 183.

On the Geographical Distribution of the Annelida.

By A. De Quatrefages.

Having completed a work on the Annelida which will form a portion of Roret's *Suites à Buffon*, M. Quatrefages has communicated to the Academy of Sciences of Paris some remarks upon the geographical distribution of those animals. He observes that, although the imperfection of our knowledge of the species would render it premature to undertake any detailed investigation of the subject, it is possible to indicate certain general laws, some of which are of the more importance as they contrast strikingly with facts universally recognized in other groups. His results are as follows:—

1. The class of Annelida properly so called (*Annelida Errantia* and *Tubicola*) is in salt waters the *geographical term corresponding* to the land and freshwater class of *Erythræina* (*Lumbrici* and *Naïdes*).

2. The class of Annelida has representatives in all seas. This is also the case with the two orders of which it is composed (*Errantia* and *Sedentaria*); in this respect the group under consideration may be said to fall under the general rules.

3. This cosmopolitism appears to extend not only to the large genera which best reproduce the general type, but also to the most exceptional subtypes, and even to those genera which might be supposed to be most characteristic. In this respect the Annelida differ from all the other groups which have been investigated from a geographical point of view.

4. Hence it results that the Annelidan fauna does not appear to